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CLAIMS

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1. (amended) A differential planetary gear apparatus characterized in that:

5        said differential planetary gear apparatus has a single-pinion-type structure in which one planetary gear is arranged in a radial direction and one or more planetary gears are arranged in a circumferential direction in a region between a sun gear and a ring gear;

10        a drive source, a speed-change motive source, and a driven unit are disposed at any one of an input side, an output side, and a speed-change side, respectively;

      said speed-change motive source comprises an electric motor; and

15        when starting said driven unit, said drive source and said speed-change motive source are started at the same time, or said speed-change motive source is started after said drive source reaches a rated rotational speed.

20        2. (amended) A differential planetary gear apparatus characterized in that:

      a planetary gear is disposed in a region between a sun gear and a ring gear;

25        a drive source, a speed-change motive source, and a driven unit are disposed at any one of an input side, an output side, and a speed-change side, respectively;

      said speed-change motive source comprises an electric motor;

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supply of electric power to said speed-change motive source is stopped when said driven unit is decelerated so that said speed-change motive source generates electric power; and

- 5       when starting said driven unit, said drive source and said speed-change motive source are started at the same time, or said speed-change motive source is started after said drive source reaches a rated rotational speed.

3. A differential planetary gear apparatus according to claim 2, wherein the electric power generated by said speed-change motive source is supplied to a resistance means.

5           4. A differential planetary gear apparatus according to claim 2, wherein the electric power generated by said speed-change motive source is returned to a power source of said speed-change motive source.

10           5. A differential planetary gear apparatus according to claim 2, wherein the electric power generated by said speed-change motive source is supplied to a storage means.

15           6. A starting apparatus for a differential planetary gear apparatus having a sun gear, a ring gear, and one or more planetary gears and having a structure in which each of a drive source, a speed-change motive source, and a driven unit is disposed at any one of an input side, an output side, and a speed-change side, said starting apparatus characterized in that:

20           said drive source is energized after a rotational speed of said drive source is increased to nearly a rated rotational speed by a starting means;

            said starting means comprises said speed-change motive source, a speed-increasing means provided at an output side  
25           of said speed-change motive source, and a rotation transmitting assembly for transmitting rotation from an output side of said speed-increasing means to said drive source; and

said rotation transmitting assembly serves as gears and rotating shafts of said differential planetary gear apparatus.

7. A starting apparatus for a differential planetary gear apparatus according to claim 6, wherein a stop means is provided on a rotating shaft connected to said ring gear, and said stop means is operated so as to lock said ring gear while the rotational speed of said drive source is increased by said starting means.

8. A starting apparatus for a differential planetary gear apparatus according to claim 6 or 7, wherein said speed-increasing means comprises a mechanical transmission.

9. A starting apparatus for a differential planetary gear apparatus according to claim 6 or 7, wherein said speed-increasing means comprises an inverter motor and an inverter.

10. A starting apparatus for a differential planetary gear apparatus according to any one of claims 6 to 9, wherein:

said differential planetary gear apparatus has a single-pinion-type structure in which one planetary gear is arranged in a radial direction and one or more planetary gears are arranged in a circumferential direction in a region between said sun gear and said ring gear; and

said speed-change motive source comprises an electric motor.

11. A starting method for a differential planetary gear apparatus having a sun gear, a ring gear, and one or more planetary gears and having a structure in which each of a drive source, a speed-change motive source, and a driven unit is disposed  
5 at any one of an input side, an output side, and a speed-change side, said starting method characterized by:

operating a brake so as to lock said ring gear when starting said drive source;

starting an inverter and an inverter motor so as to rotate  
10 said drive source at a predetermined rotational speed;

energizing said drive source to start said drive source at the predetermined rotational speed; and

operating said drive source in a normal operation state.

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